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10/557,820	11/23/2005	Kwan Young Han	P2614US00	2544

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EXAMINER	
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ART UNIT	PAPER NUMBER
2894	

NOTIFICATION DATE	DELIVERY MODE
04/28/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/557,820	HAN ET AL.	
	Examiner	Art Unit	
	TONY TRAN	2894	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *03* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 February 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. 35 U.S.C. 103 Conditions for patentability; non-obvious subject matter.

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-6, 8-10 and 11-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts et al. (Patent No.: US 6335548 B1) (hereinafter Roberts) in view of Pederson (Patent No.: US 6590343 B2).

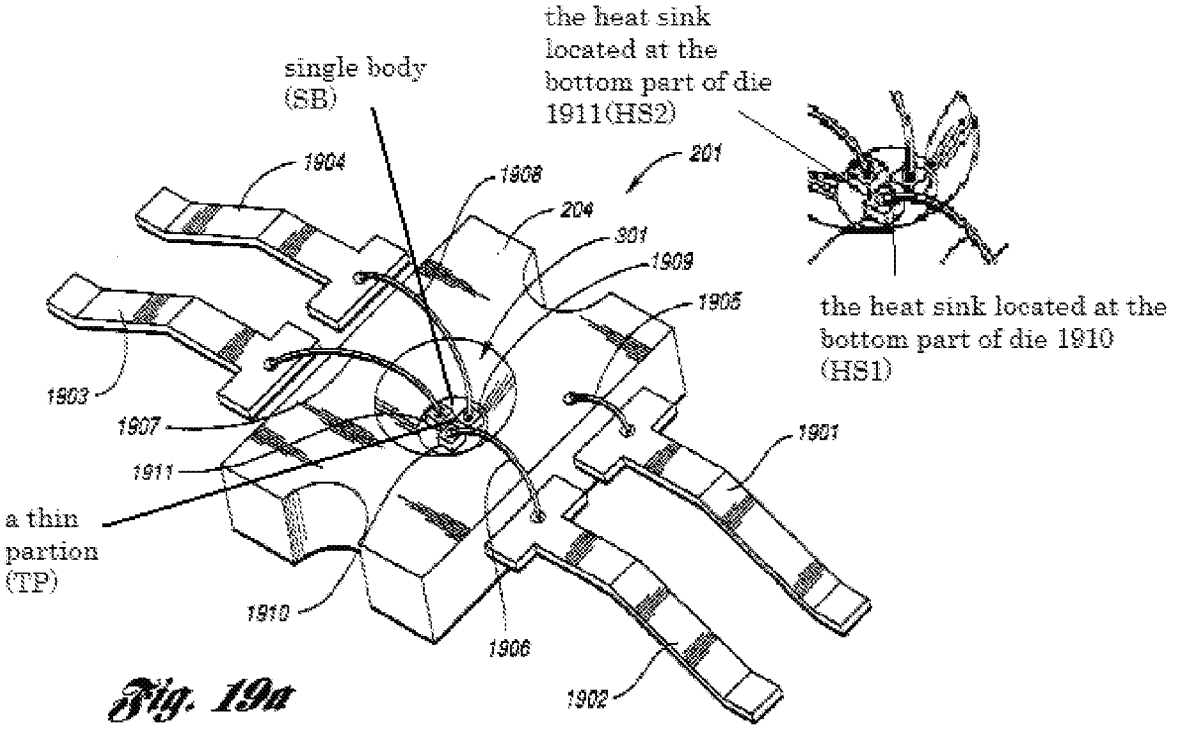

Fig. 19a

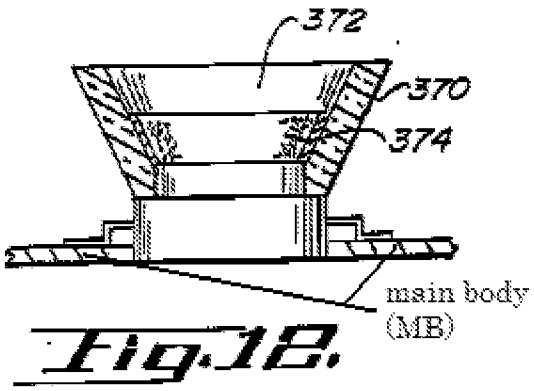

Fig.18.

Regarding **Claim 1**, Roberts, one embodiment, FIGS. 19A-19B teaches a high power light emitting diode package comprising:

a insulation main body (204, col. 29, lines 61-65, note that could be an alternatively of another high thermal conductivity material such as ceramic, col. 10, lines 1-6);

at least two lead terminals (1902 & 1903, col. 30, lines 5-10) fixed to the main body (204); and

at least two heat sinks (HS1 & HS2, FIG. 19a [as shown above], note that HS1 and HS2 are sitting on top of heat extraction 204 which are conducting heat to 204 therefore they are considering as the heat sinks) of electrically and thermally conductive materials, the heat sinks being separated from each other and fixed to the main body (204).

However, Roberts, one embodiment, FIGS. 19A-19B does not disclose a heat sink of electrically and thermally conductive metallic materials

Nevertheless, Roberts, one embodiment, FIGS 5-6 does teach a heat sink of electrically and thermally conductive metallic materials (502, col. 16, lines 30-67)

Therefore, since Roberts, one embodiment, FIGS. 19A-19B and Roberts, one embodiment, FIGS 5-6 teach on the same endeavor. It would have been obvious to one

ordinary skill in the art at the time the invention was made to further including a heat sink of electrically and thermally conductive metallic materials in Roberts, one embodiment, FIGS. 19A-19B, as taught by Roberts, one embodiment, FIGS 5-6. One would have been motivate to make such a change to improve electrical characteristic and performance of light emitting device (Roberts, BACKGROUND ART).

Furthermore, after the combining of Roberts, one embodiment, FIGS. 19A-19B and Roberts, one embodiment, FIGS 5-6 would teach at least two heat sinks of electrically and thermally conductive metallic materials.

However, Roberts et al., one embodiment, FIGS. 19A-B does not disclose wherein a lower portion of each of the light emitting diode is exposed to the outside of the bottom surface of the main body through the opening of the main body.

Nevertheless, Pederson, one embodiment, FIG. 12 does teach wherein the lower portion the light emitting diode (306) is exposed to the outside and through the opening of the main body (MB, FIG. 12 [as shown above], note that 306 is extending through the circuit substrate).

Therefore, since Roberts, one embodiment, FIGS. 19A-B and Pederson, one embodiment, FIG. 12 teach on the light emitting device. It would have been obvious to one ordinary skill in the art at the time the invention was made to further including wherein the light emitting diode is exposed to the outside and through the opening of the main body in Roberts et al., one embodiment, FIGS. 19A-B, as taught by Pederson, one embodiment, FIG. 12. One would have been motivate to make such a change to improve the electrical characteristic and performance of the light emitting device.

Furthermore, after the combining of Roberts, one embodiment, FIGS. 19A-B and Pederson, one embodiment, FIG. 12 would teach wherein a lower portion of each of the at least two heat sinks is exposed to the outside of the bottom surface of the main body through the opening of the main body.

Regarding **Claims 2-3**, Roberts, one embodiment, FIGS. 19A-19B further teaches the package of claim 1, wherein each of the at least two heat sinks (HS1 & HS2) has a reflective surface (301, col. 30, lines 9-11 & col. 12, lines 10-15) extended from an upper surface thereof (claim 2).

wherein the at least two heat sinks are a pair (HS1 & HS2, FIG. 19a as shown above) (claim 3).

Regarding **Claim 4**, Roberts, one embodiment, FIGS. 19A-19B further teaches the package of claim 3, further comprising: at least one light emitting diode die (top part of die 1910 or 1911) mounted on upper surfaces of the at least two heat sinks (HS1 & HS2), the die (1910 & 1911) being directly and electrically connected to the heat sinks (HS1 & HS2) through a surface of the die (top surface of 1910 & 1911).

Regarding **Claim 5**, Roberts, one embodiment, FIGS. 19A-19B further teaches the package of claim 4, further comprising: bonding wires (1906 & 1907) electrically connecting the at least two lead terminals (1902 & 1903), the at least two heat sinks (HS1 & HS2) and the at least one light emitting diode die (1910 & 1911).

Regarding **Claim 6**, Roberts, one embodiment, FIGS. 19A-19B further teaches package of claim 4, further comprising: a lens (401, col. 30, lines 9-10) attached to the main body (204), the lens (401) enclosing the at least one light emitting diode die (1910 & 1911).

Regarding **Claim 8**, Roberts et al., one embodiment, FIGS. 19A-B further teaches the package of claim 4, further comprising: a fluorescent material converting the wavelength of light emitted from the at least one light emitting diode die (fluorescent dyes....within the encapsulant....re-emit it at lower wavelength, col. 24, lines 39-45, note that the encapsulant is the 203, FIG. 19B, col. 30, lines 8-10).

Regarding **Claim 9**, Roberts et al., one embodiment, FIGS. 19A-B further teaches he package of claim 1, further comprising:

light emitting diode dies (top surface of 1910 & 1911) mounted on the respective heat sinks (HS1 & HS2), the light emitting diode dies emitting different wavelengths of light (the three dies 1909, 1910 and 1911 emit at red, blue, and green wavelengths respectively, col. 30, lines 13-14).

Regarding **Claim 10**, Roberts et al., one embodiment, FIGS. 19A-B further teaches the package of claim 9, wherein the at least two lead terminals (1902 & 1903) include:

lead terminals (1902 & 1903) electrically (connected to the at least two heat sinks (HS1 & HS2) respectively; and a common lead terminal electrically connected to all of the at least two heat sinks (the base (cathode) of the dies, the cup 301 and 204, col. 29, lines 61-67 and col. 30, lines 1-11, FIG. 9a).

Regarding **Claim 12**, Roberts et al., one embodiment, FIGS. 19A-B further teaches the package of claim 9, wherein the light emitting diode dies include light emitting diode dies (1909, 1910, and 1911) emitting a first wavelength of light (red), a second wavelength of light (blue) and a third wavelength of light (green), respectively.

Regarding **Claim 13**, Roberts et al., one embodiment, FIGS. 19A-B further teaches wherein the first wavelength, the second wavelength and the third wavelength are red

wavelength, green wavelength and blue wavelength, respectively (the three dies 1909, 1910 and 1911 emit at red, blue, and green wavelengths respectively, col. 30, lines 13-14).

Regarding **Claim 15**, the combining of Roberts et al., one embodiment, FIGS. 19A-B further teaches the package of claim 1, further comprising at least one septum (TP, Fig. 19a [as shown above]) formed in a single body (SB) along with the main body (204) to separate the at least two heat sinks (HS1 & HS2).

Regarding **Claim 11 and 14**, Roberts, one embodiment, FIGS. 19A-B further does not disclose the limitation as claims 11 and 14.

Nevertheless, Pederson does teach an additional heat sink (346, FIG. 18, col. 14, lines 45-50); and a zener diode (614, FIG. 24, col. 18, lines 60-65) mounted on the additional heat sink (note that the zener diode is mounted on one of the opening 344, FIG. 18) (claim 11), and

a controller (50, FIG. 26, col. 12, lines 10-20) for controlling the electric power supplied to the light emitting diode package (608, 610, 612), wherein the controller controls the amount of the current supplied to the respective heat sinks (microcontroller 900 switches to decrease the current, see the ABSTRACT) (claim 14).

Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to include all the limitation in claims 11 and 14, as taught by Pederson. One would have been motivate to make such a change to optimize the performance of the LED (Pederson, col. 1, lines 10-30), and inclusion of such would improve the photometric efficiency.

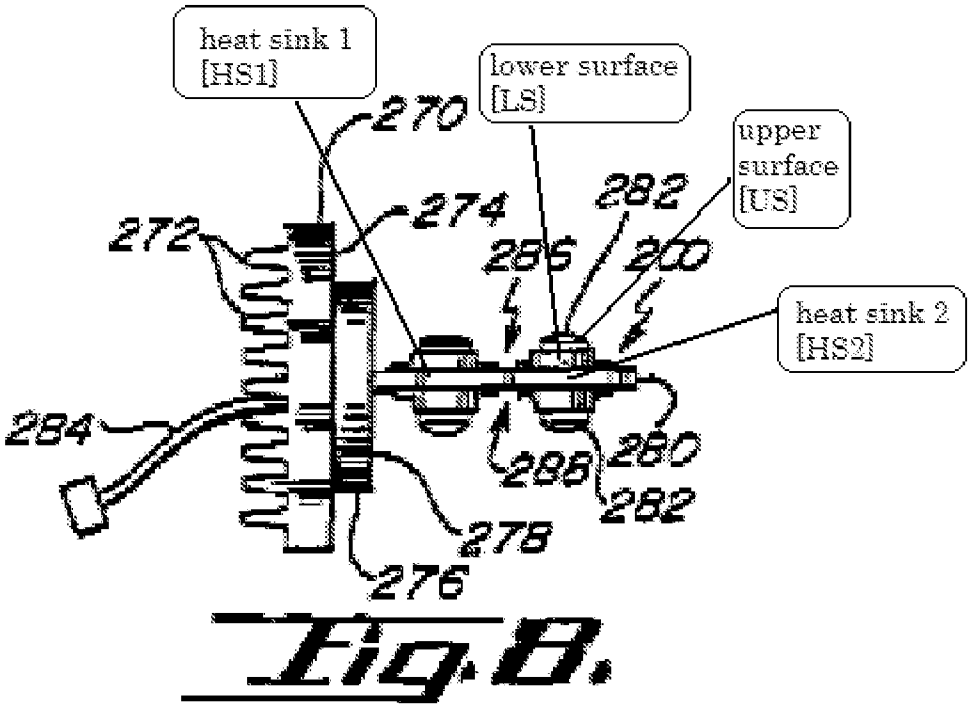

Fig. 8.

Regarding **Claim 16**, Roberts, one embodiment, FIGS. 19A-19B teaches a high power light emitting diode package comprising:

an insulation main body (204, note that could be an alternatively of another high thermal conductivity material such as ceramic, col. 10, lines 1-6);

at least two lead terminals (1902 & 1903) fixed to the main body (204);

at least two heat sinks of electrically and thermally conductive materials (HS1 & HS2), the heat sinks being separated from each other and fixed to the main body (204),

However, Roberts et al., one embodiment, FIGS. 19A-B does not disclose each of the at least two heat sinks having an upper surface and a lower surface, the lower surface of each of the at least two heat sinks being relatively wider than the upper surface of each of the at least two heat sinks; and a light emitting diode die mounted on one of the upper

surfaces of the heat sinks, the light emitting diode die having a lower surface facing the upper surface of each of the at least two heat sinks, wherein the upper surface of each of the at least two heat sinks is wider than the lower surface of the light emitting diode die, so that the light emitting diode die mounted partly on a portion of the heat sink.

Nevertheless, Pederson, one embodiment, FIGS. 7-9 does teach each of the at least two heat sinks ([HS1], [HS2]) having an upper surface ([US], FIG. 8, as shown above) and a lower surface [LS], the lower surface [LS] of each of the at least two heat sinks ([HS1], [HS2]) being relatively wider than the upper surface [US] of each of the at least two heat sinks ([HS1], [HS2]); and

a light emitting diode die (282, [0105]) mounted on one of the upper surfaces of the heat sinks ([HS1], [HS2]), the light emitting diode die having a lower surface (bottom surface of 282) facing the upper surface (top surface of [HS1] & [HS2]) of each of the at least two heat sinks ([HS1], [HS2]),

wherein the upper surface of each of the at least two heat sinks is wider than the lower surface of the light emitting diode die (note that the LED illumination sources 282 is embedded inside the top surface of [HS1] & [HS2]), so that the light emitting diode die (282) mounted partly on a portion of the heat sink (top portion of upper surface of HS1 & HS2).

Therefore, since Roberts, one embodiment, FIGS. 19A-B and Pederson, one embodiment, FIG. 12 teach on the light emitting device. It would have been obvious to one ordinary skill in the art at the time the invention was made to further including each of the at least two heat sinks having an upper surface and a lower surface, the lower surface of each of the at least two heat sinks being relatively wider than the upper surface of each of the at least two heat sinks; and a light emitting diode die mounted on one of the upper

surfaces of the heat sinks, the light emitting diode die having a lower surface facing the upper surface of each of the at least two heat sinks, wherein the upper surface of each of the at least two heat sinks is wider than the lower surface of the light emitting diode die, so that the light emitting diode die mounted partly on a portion of the heat sink in Roberts et al., one embodiment, FIGS. 19A-B, as taught by Pederson, one embodiment, FIGS. 7-9. One would have been motivate to make such a change to provide a unique and desired combination lighting effect (Pederson, col. 1, lines 10-30).

In regards to **Claims 17-18**, Roberts, one embodiment, FIGS. 19A-B differs from the invention by not showing wherein the at least two heat sinks each consist of either copper, gold, silver, or aluminum. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to further including wherein the at least two heat sinks each consist of either copper, gold, silver, or aluminum since it has been held to be within the general skill of a worker in the art to select a known material such as copper, gold, silver, or aluminum for conducting heat on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

3. **Claim 7** is rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts et al. (Patent No.: US 6335548 B1) (hereinafter Roberts) in view of Pederson, one embodiment, FIG. 12 and further in view of Roberts et al., another embodiment, FIGS. 1-15 filed in IDS on 7/26/07.

Regarding **Claim 7**, Roberts, one embodiment, FIGS. 19A-B further discloses wherein the lens (401) includes at least one light emitting diode die (1910).

However, Roberts, one embodiment, FIGS. 19A-B and Pederson, one embodiment, FIGS. 15-16 do not disclose includes an optically transparent material which is directly contacted with the at least one light emitting diode die.

Nevertheless, Roberts et al., another embodiment, FIGS. 1-15 does teach includes an optically transparent material (501, FIG. 5, col. 17, lines 48-50) which is directly contacted with the at least one light emitting diode die (1910).

Therefore, since all three Roberts, one embodiment, FIGS. 19A-B, Pederson, one embodiment, FIG. 12 and Roberts et al., another embodiment, FIGS. 1-15 teach on the same light emitting device. It would have been obvious to one ordinary skill in the art at the time the invention was made to further including includes an optically transparent material which is directly contacted with the at least one light emitting diode die in Roberts, one embodiment, FIGS. 19A-B and Pederson, one embodiment, FIG. 12, as taught by Roberts et al., another embodiment, FIGS. 1-15. One would have been motivate to make such a change to improve the electrical characteristic and performance of the light emitting device.

Response to Arguments

4. Applicant's arguments, filed 02/18/09 with respect to the rejection(s) of claim(s) 1-16 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Patent No.: US 6590343 B2) which is the parent of the previous applicant: Pub. No.: US 2005/0001562 A1).

CONCLUSION

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to TONY TRAN whose telephone number is (571) 270-1749. The examiner can normally be reached on Monday through Friday: 7:30AM-5:00PM (E.S.T.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kimberly Nguyen can be reached on (571) 272-2402. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tony Tran/
Examiner, Art Unit 2894
/Brook Kebede/
Primary Examiner, Art Unit 2894